FACILITIES ENGINEERING APPLICATIONS PROGRAM

Innovative Ideas for the Operation, Maintenance, & Repair of Army Facilities

Modified Prescription Athletic Turf for Cold Climate Parade Fields

Above: *Modified prescription athletic turf withstands heavy use by the Corps of Cadets.*
Right: *Prescription athletic turf covers a West Point parade field.*

Improve Drainage Using Money-Saving Turf

PROBLEM: Foot traffic on military parade fields wears down turf and compacts soil, destroying grass and causing muddy conditions.

TECHNOLOGY: Prescription athletic turf (PAT) surfaces, which have proven reliable at professional sports facilities, have been modified to make them more affordable at installations.

DEMO SITES: U.S. Military Academy, West Point, NY — FY89

BENEFITS:
- Withstands intense use
- Ensures a proper setting for ceremonial events
- Improves drainage
- Reduces soil compaction and frost heaving
- Reduces winter turf losses
- Lowers sod replacement and labor costs

Durable Turf Takes Punishment

Modified Turf Preserves Parade Fields

Frequent use of military parade fields wears turf down and compacts soils. This is especially true during cold weather when grass does not grow actively. Eventually the turf dies, causing muddy conditions. Even when sod is replaced, compacted soils remain intact and prevent adequate drainage. Also, turf maintenance is labor-intensive, making it expensive.

Prescription athletic turf (PAT) — the kind used at professional sports facilities — withstands the harsh punishment that kills natural turf. PAT systems, which can be used in any climate, include drainage to help prevent flooding after heavy rains. However, cost has prevented many installations from using it.

Now a modified PAT is available that costs substantially less, yet provides suitable plant cover for parade fields and other heavily used areas. It was designed by experts from the U.S. Army Cold Regions Research and Engineering Laboratory (USACRREL), West Point, and Cornell and Rutgers Universities.

Quick Results at Demo Site

For the 1989 FEAP demonstration, a private contractor installed the modified PAT on 2 acres of a 40-acre field.

First, workers removed the poor quality, existing annual bluegrass sod and installed new drainpipes in trenches. They covered the drainpipe with geotextile, and then covered the geotextile with washed traprock and quarry grit. To aerate the soil and improve drainage, they shattered compacted subsoils. A topsoil cover that was 70 percent sand assured adequate permeability to the subsurface soil.

Workers added pulverized limestone to correct excessive soil acidity and gypsum to help keep the soils permeable. Fertilizer application provided adequate nutrients for the new grass.

Due to time constraints, sodding was chosen over seeding. The sod was a blend of improved Kentucky bluegrass cultivars grown in soil composed of 70 percent sand. To improve the wear tolerance, perennial ryegrass varieties were “slit-seeded” into the established Kentucky bluegrass turf cover. Researchers used a machine that cut slits in the soil 1 inch apart and dropped ryegrass seeds into the soil. By doing this, identically colored ryegrass grew with Kentucky bluegrass. This method improved resistance to foot traffic while allowing the existing turf to recover.

The contractor finished installing the modified PAT in about one month. The Corps of Cadets began using this field in August 1989.

Natural Drainage Saves Turf, Money

The modified PAT system cost about $13/square yard compared to more than $51/square yard for conventional PAT. The modified PAT system at West Point (2 acres, or 9,680 square yards) cost $125,000. Much of the savings comes from using the soil’s natural drainage capacity instead of pumps and tubing. The demonstration shows that the savings cause no loss of effectiveness: fields can be used immediately after heavy rains or irrigation.

As long as the PAT is managed correctly, it should never need replacing. Proper maintenance includes special fertilization and irrigation.

Procurement Information

Results of the project were published in *Proceedings of the Land Reclamation: Advances in Research and Technology Symposium* by the American Society of Agricultural Engineers. An unpublished report is also available: *Turfgrass Stand Improvement and Management on the Parade Field at West Point, NY*, by A.J. Palazzo et al., USACRREL, October 1990.

Both reports can be obtained from USACRREL.

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Issued by U.S. Army Center for Public Works, Fort Belvoir, VA, IAW AR 25-30. Additional copies are available from the FEAP Information Center, P.O. Box 9005, Champaign, IL 61826-9005, phone 217-352-6511 x386.